

CLAIMS:

1. An air-conditioning apparatus for controlling condition, for example, temperature, in at least one room to a predetermined temperature desired value by ventilation with heated or cooled supply air, comprising:

a supply air motor which provides the supply air over a supply air channel to the room to be air-conditioned;

a cooling and/or heating device for cooling or warming of the supply air;

an exhaust air motor, which draws exhausted air over an exhaust air channel out of the room to be air-conditioned, and

a regulator of the exhaust air motor for forming a room excess pressure with respect to the outside pressure

2. The air-conditioning apparatus according to claim 1, wherein a desired value for the regulator of the exhaust air motor is determined by outside temperature and/or supply air temperature and/or supply air pressure.

3. The air-conditioning apparatus according to claim 2, wherein the actual value for the regulator of the exhaust air motor is formed by a channel pressure differential calculated from a difference between an absolute value of the pressure in the supply air channel and an absolute value of the pressure in the exhaust air channel.

4. The air-conditioning apparatus according to claim 2, wherein the actual value for the regulator of the exhaust air motor is formed by the room pressure differential which is yielded from the difference between the outside pressure and the room pressure

5. The air-conditioning apparatus according to claims 3, wherein the room excess pressure changes exclusively over a predetermined temperature range of the outside temperature and/or of the supply air temperature with change of the outside temperature or of the supply air temperature, in which with an outside temperature of supply air temperature before this temperature range the room excess pressure has in each case a certain constant magnitude and with an outside temperature after this temperature range the room excess pressure has in each case a further determined constant magnitude.

6. The air-conditioning apparatus according to claims 5, wherein within the temperature range the room pressure falls with rising outside temperature from a maximal excess pressure to a minimal excess pressure.

7. The air-conditioning apparatus according to claim 6, wherein the room pressure differential is measured at a level above 0, where room height corresponds to outside height in respect to sea level.

8. The air-conditioning apparatus according to claim 7, wherein the temperature of the supply air and the channel pressure of the supply air are coupled with one another in such manner that both in dependence on the level of the room temperature to the level of the room air supply temperature, and also in dependence on the level of the room temperature

to the level of the desired value of the room temperature the channel pressure of the supply air into the room, the rooms or room zones is raised or lowered.

sub a3 9. The air-conditioning apparatus according to claim 8, wherein the channel pressure of the supply air into the room, the rooms or room zones is adjusted over the performance of the supply air motor.

10. The air-conditioning apparatus according to claim 9, wherein in case when the desired value of the room temperature is less than the actual value of the room temperature, the channel pressure of the supply air is lowered with rising room temperature.

sub a4 11. The air-conditioning apparatus according to claim 10, wherein in case when the desired value of the room temperature is greater than the actual value of the room temperature the channel pressure of the supply air is reduced with falling room temperature.

12. The air-conditioning apparatus according to claim 11, wherein in case when the desired value or actual value of the temperature is less than the supply air temperature and the actual value of the room temperature is less than the desired value of the room temperature, the channel pressure is raised with rising supply air temperature.

13. The air-conditioning apparatus according to claim 12, wherein in case when the desired value or actual value of the room temperature is greater than the supply air temperature and the actual value of the room temperature is greater than the desired value of the room temperature, the channel pressure is increased with falling supply air temperature.

14. The air-conditioning apparatus according to claim 13, wherein the channel pressure of the supply air varies exclusively over a predetermined temperature range of the supply air temperature, with a supply air temperature before this temperature range the channel pressure of the supply air always has a certain constant magnitude and with a supply air temperature after the temperature range the channel pressure of the supply air always has a further determined constant magnitude.

15. The air-conditioning apparatus according to claim 11, wherein with a supply air temperature higher with respect to the room temperature, over a certain temperature range the channel pressure of the supply air increases from its minimum performance up to its maximum performance with rising supply air temperature and with decreasing supply air temperature it falls correspondingly.

16. The air-conditioning apparatus according to claim 9, including the regulating circuit which regulates the channel pressure of the supply air, said circuit is connected to the temperature regulating circuit, the channel pressure desired-value guide magnitude of the conveyance volume circuit being settable in a fixed relation to the supply air temperature actual value.

17. The air-conditioning apparatus according to claim 16, wherein in simultaneous air-conditioning of several rooms or room zones the individual rooms or room zones in each

case are connected, over a supply-air and exhaust-air lines to the central supply-air and exhaust-air channels and that in the individual supply-air and/or exhaust air lines there are arranged throttle clack valves over which the channel pressure of the supply air into the room, rooms or room zones is adjusted.

18. The air-conditioning apparatus according to claim 17, wherein the throttle clack valves are settable in dependence on the channel pressure of the supply air or the turning rate of the supply air motor.

19. The air-conditioning apparatus according to claim 18, wherein a regulating circuit for the setting-in of the opening cross section of the throttle clack valves does not go below a minimum opening cross section yielded in dependence on the channel pressure of the supply air in the adjustment of the throttle clack valves, and the regulating circuit sets in this minimal opening cross section in such manner that each room receives a predetermined absolute minimum fresh volume.

20. The air-conditioning apparatus according to claim 17, wherein the exhaust air channel and the supply air channel are connected with one another over a return air channel, there being provided at least one exhaust air clack valve in the exhaust air channel connecting to the exhaust air channel, at least one mixed air clack valve in the return air channel, and at least one fresh air clack valve in the fresh air channel engaged before the supply air channel.

21. The air-conditioning apparatus according to claim 20, wherein the minimum opening cross section of the throttle clack valves is adjusted in dependence on the opening of the fresh air clack valve, the exhaust air clack valve, and the mixed air clack valve.

22. The air-conditioning apparatus according to claim 21, wherein with regulated conveyance volume of the supply air and of the exhaust air the opening settings of the throttle clack valves in a room or a room zone are equal.

23. The air-conditioning apparatus according to claim 22, wherein the setting magnitude of at least one regulator, especially of the temperature regulator, is connected to a switching arrangement on outlet side, and the switching arrangement on an overswinging of the regulating magnitude selects a value predetermined for it for the setting magnitude which lies below the value simultaneously selected by the regulator.

24. The air-conditioning apparatus according to claim 23, including a fresh air clack valve in a fresh air channel engaged before the supply air channel, a mixed air clack valve in a return air channel connecting the supply air channel with the exhaust air channel, and a discharge air clack valve in a discharge air channel connected to the exhaust air channel, in which the settings of the fresh air clack valve, of the discharge air clack valve and of the mixed air clack valve are regulated in common in dependence on the turning rate of the supply air motor or on the channel pressure of the supply air, and in which up to a certain minimum opening for the ensuring of a fresh air minimum with increasing turning rate of the supply air motor and/or with increasing channel pressure of the supply air, the

opening cross sections of the fresh air clack valve and of the exhaust-air clack valve are reduced and the opening cross section of the mixed air clack valve is increased.

25. The air-conditioning apparatus according to claim 24, wherein for simultaneous air-conditioning of several rooms the actual temperature of each room is fed to a central regulating arrangement, and that a temperature value to be determined individually from these actual values is selected and supplied as actual value for the heating regulator.

26. The air-conditioning apparatus according to claims 25, including a moistening arrangement, which moistens the supply air in the supply air channel, in which the moistening arrangement is regulated both in dependence on the room moisture or on the humidity of the exhaust air and also on the supply air temperature.

27. The air-conditioning apparatus according to claim 26, including a first heating device installed in the supply air channel, a cooling device engaged on outlet side of the first heating arrangement in the supply air channel and a second heating device engaged on outlet side of the cooling device in the supply air channel, in which the second heating device is regulated in dependence on the actual value moisture for the desired value moisture.

28. The air-conditioning apparatus according to claim 27, wherein with rising of the actual value moisture over the desired value moisture, the heating performance of the second heating device rises.

29. The air-conditioning apparatus according to claim 28, wherein the heating performance of the second heating device is regulated with a regulator, or with the rising actual value moisture rises exclusively over a predetermined moisture range of the room moisture, with a room moisture before this moisture range, the heating performance has a certain constant magnitude and with a room moisture after the moisture range the heating performance always has a further determined constant magnitude.

30. The air-conditioning apparatus according to claim 29, wherein the channel pressure of the supply air is not increased during the dehumidifying process.

31. The air-conditioning apparatus according to claim 23, wherein the fresh air clack valve and the exhaust air clack valve are settable in dependence on the opening setting of the mixed air clack valve.

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add B, 7
add C, 3

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